



PIER Energy System Integration Program Area

Energy Storage for Transmission or Distribution Applications (#94)

Contract #: 500-02-028 **Project #**16

Contractor: Electric Power Research Institute (EPRI)

Project Amount: \$28,400

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Status: Completed

Project Description:

EPRI's Energy Storage for Transmission and Distribution Applications Program offers a portfolio of innovative energy storage options to support Transmission and Distribution owners in their objective to lower capital, maintenance, and operating costs of their equipment. This is accomplished by providing credible and timely data on the cost, benefit, performance and technology readiness for energy storage options suitable to peak shaving applications at the high voltage transmission level and the low voltage distribution level. The issue is not if energy storage devices can reduce peak loading on equipment while increasing their use factor, because energy storage devices are doing that function today in specialized non-transmission and distribution applications. Rather, the real issue is how to specify and deploy the proper energy storage option for the re-regulated, restructured utility transmission and distribution industry.

This project is designed to develop and deploy innovative modifications of existing storage options that have the highest value for today's transmission and distribution systems. Project activities include assessments of the economic and technical feasibility of existing and emerging energy storage applications that are best suited to today's re-regulated transmission and distribution utility industry. Proper assessment and application of energy storage technologies that defer new transmission and/or distribution capacity and increase reliability and through-put of existing transmission and/or distribution assets can reduce capital costs and extend life of transmission and/or distribution equipment. This project will provide the information and data necessary to make energy storage decisions. Next, field trials on promising prototype and emerging energy storage options will be performed, followed by fundamental technology development of the most promising energy storage system. Final activities will provide quantified strategic and operational economic benefits (and appropriate new tools) of energy storage systems applied to transmission or distribution systems.

This project supports the PIER Program objective of:

- Improving the reliability, quality, and sufficiency of California's electricity by developing storage option modifications for transmission and distribution systems.

Proposed Outcomes:

1. Create a handbook delineating cost and performance of key energy storage options best suited to transmission or distribution applications such as super-capacitors, advanced batteries, flywheels, and superconducting magnetic energy systems.
2. Perform an assessment of the economic and technical feasibility of existing and emerging energy storage applications best suited for the industry.
3. Conduct field trials on promising prototype and emerging energy storage options for transmission or distribution applications.

Actual Outcomes:

1. Handbook on Energy Storage Technologies for Application at the Transmission and Distribution Level: Technology Status, Lessons Learned, Applications and Economics. EPRI Product ID #1001834.
2. Energy Storage Technology Valuation Primer: Techniques for Financial Modeling. EPRI Product ID #1008810.
3. No Field trials on promising prototype and emerging energy storage options for transmission or distribution applications were conducted.

Project Status:

The project was completed in December 2004.

The results of the project are expected to be used by the utility industry.